not found in all cases of amaurotic family idiocy, so that the uncertainty concerning the existence of ocular changes in my two cases is of less importance. The absence of ocular changes must make the diagnosis difficult.

A CASE OF CARCINOMA OF THE URETER APPARENTLY INDUCED BY A CALCULUS LODGED IN ITS JUXTAVESICAL PORTION.[1]

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and
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I. Clinical. The following case is presented largely for its pathological interest, some of its features being so extraordinary as to make some report of it scientifically imperative. The surgical treatment will be given in some detail, although, in the light of subsequent developments in the case, a different course would be pursued were a similar one again confronted. The safety of the measures adopted for relief is confirmed by the satisfactory recovery from the operation itself, while the failure ultimately to save the patient's life depended upon circumstances beyond my control.

The patient, Mr. J. H., aged forty-seven years, was admitted to Harper Hospital on October 29, 1903. His father had died, at seventy-six years, of Bright's disease; his mother was living. The maternal grandfather died of tuberculosis, as did also two maternal uncles. One maternal uncle died of epithelioma upon the face. One sister died in infancy; two brothers died of typhoid fever.

From the fourth to the twenty-fifth year of the patient's life he suffered frequent attacks of what he called "bellyache," more severe in the left side of the abdomen and radiating toward the testicle. It was said to be followed by a feeling of coldness in the centre of the abdomen. During his twenty-fifth year, he had a severe attack lasting from June until August, when the appearance of sudden relief was attended with a profuse discharge by the urethra. He was then free from pain for three years, at the end of which time occurred another severe attack of pain, lasting two days, and likewise followed by sudden relief. Two or three such attacks followed during the next ten years, and during the same interval he had occasional chills and fever.

September 1, 1903, he began to have severe cramping pain in the centre of the abdomen, accompanied by nausea. This pain recurred at intervals until October 10th, when he suffered an attack more characteristic of renal colic. From this time until he entered the hospital, October 29th, it had been necessary to keep him continually under the influence of morphine. A marked scoliosis due to sympathetic muscular contraction was apparent. His pulse was 104, weak and compressible; the temperature 101°.

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[1] Read before the Michigan State Medical Society (Surgical Section), Grand Rapids, May 26, 1904.

Dr. Lake, of Detroit, who had attended the patient for about two weeks before referring him to me, believed it a case of ureteral calculus. This diagnosis certainly best harmonized the facts of the case, but the positive location of the stone in any case cannot be made from the symptoms, and even under the most careful examination it is sometimes impossible to distinguish calculus ureteritis from other forms. In a tuberculous ureter a thickening may be mistaken for a stone, but the finding of tubercle bacilli in the urine would clear the diagnosis. Then the hæmaturia of tuberculosis is not relieved by rest in bed, as would generally be true of hæmaturia due to calculus.

Examination of the urine on admission to the hospital showed: specific gravity, 1008; reaction, alkaline; albumin, a faint trace; pus cells numerous, and an occasional red blood cell; many round and a few squamous epithelial cells; mucus, a small amount. With calculi in the kidney or ureter the urine is usually acid, regardless of pus and blood. Pus coming from the kidney produces a uniform turbidity, and this turbidity persists after the pus and mucus from a cystitis would have settled (Morris).

The tension of muscle over the kidney and in the loin was so great that I could not determine enlargement of the organ. The skiagraphic examination of the case was negative. The cystoscope likewise failed to render material service owing to the free hemorrhage arising from the interference of an enlarged prostate and the presence of a posterior urethritis. Furthermore, the patient's condition suggested the wisdom of proceeding without delay with the operation itself (November 2, 1903).

The beginning of the operation was by the lumbar incision for the purpose of exploring the kidney and the upper ureter. The wisdom of this procedure was confirmed by finding the kidney greatly enlarged and sacculated, it being distended with the retained purulent secretions. The thinning and atrophy of the parenchyma supported the clinical indications that the obstruction was complete, with occasional intermissions in which the obstruction became incomplete. Nephrectomy was immediately done.

After freeing the thickened ureter as far down as the finger could reach, I made an ilio-inguinal incision and stripped back the peritoneum. Then passing a long forceps upward under the attachment of the muscles to the iliac crest, I grasped the severed end of the ureter, dragged it out of the lower incision, and freed it as far as its point of attachment to the bladder. In breaking up the adhesions about the ureter many little pockets of pus were opened, and the walls of the tube were the seat of considerable deposits of a friable calcareous substance, so that, in the effort to reach the vesical attachment of the ureter, it separated, leaving its ragged end bathed in pus and exposing a calculus.

Considering the rarity of malignant disease of the ureter and the dangers of prolonged operation in a patient so debilitated, it was thought advisable to delay any operative measures looking to the removal of the small remnant of ureter or other tissue left attached to the bladder. It was recognized that unless malignant disease was present no time would be lost by simply draining and approaching any benign neoplasm recurring later by way of the bladder itself. If malignancy were present, furthermore, the fact of the extension to the periureteral tissues, already possible, rendered the prognosis very uncertain. In the light of these considerations the wound was closed, allowing ample provision for drainage, both lumbar and inguinal. The patient reacted fairly well after the operation, and the symptoms of sepsis that had preceded it now gradually disappeared.

A reasonable improvement continued for about four weeks, when severe sacral pain began, to control which required large doses of morphine. The routine examination of the tissues from about the lower end of the ureter was reported from the laboratory as revealing an adenoma without malignancy; but later Dr. Safford, who undertook a careful histological examination of the case, found that, in the ureteral wall, in immediate proximity to the seat of the calculus, a decided and progressive malignant process was complicating the papillomatous and adenomatous changes, and that these latter seemed the results, more or less direct, of the irritating presence of the calculus. Attention was called to the fact that the primary, and as yet benign, steps in the process were to be found in the mucosa of the renal pelvis, which seems to permit the supposition that, owing to a more or less prolonged stay of the calculus in this location, the beginning had here been made toward what might likewise have ended in malignancy had not the source of irritation escaped from the kidney. The result of this irritation had, however, at no point attained to malignancy except in the lower ureter. Whether at this lower focus the stone directly set up the processes preliminary to malignancy, or whether these changes were induced by cells transplanted from the renal pelvis, is of minor importance.

The pain continuing to be intolerable, it was thought justifiable to attempt its relief, even though temporary, since by so doing the observation would throw further light upon the character of the growth. Accordingly, on the 26th of December, the patient was again anæsthetized and the exploratory cystotomy revealed an essentially normal vesical mucosa. There was congestion and the ureteral orifice was open, as had already been evident in the effort to inflate the bladder for cystoscopic examination. The bladder was then carefully closed and the peritoneum opened. The cause of the pain was apparent; the neoplasm had extended beneath the peritoneum from the point of the ureteral separation to the promontory of the sacrum, which it covered. The greater part of the growth I removed from the spine, with the aim temporarily to relieve the pain, and in this I was not disappointed.

The patient, however, died January 20, 1904, apparently of exhaustion. Unfortunately, autopsy was not obtained.

The importance of this case is recognized when we find the writer of an exhaustive article recently appearing in the *Annals of Surgery* upon the "Surgery of the Lower Ureter" saying that primary tumor of the lower end of the ureter must be extremely rare, as he had found no recorded case. Ziegler's *Lehrbuch*, 1895, says in a very brief comment upon the tumors of the renal pelvis and ureter, that carcinoma may be the terminal event in a calculous pyelitis. Hektoen, reporting his case in 1896, says: "Recent works on surgery and on tumors contain no mention of carcinoma of the ureter." If we confine our observations to those carcinomata of the ureter the reports of which leave no doubt of their primary relation to that organ, a review of all would be necessarily brief. The most complete collection of cases of tumors of the kidney is that of Albarran, and from this collection there are five which leave little to question as to their primary origin from the ureter. Some others are apparently extensions from the renal pelvis by continuity or by being engrafted from growths in that location. One case, that of Hedenius, is, from the best report of it available, somewhat doubtful, though more probably arising in the renal pelvis. One, that of Davy, is for some reason not in Albarran's collection, but the report so strongly suggests the case herein reported that it should find its place in any enumeration of these tumors. I will mention briefly all of these cases in order better to allow judgment of the one I have described.

Case I.—Reported by Jona. Male. Tumor described as an adenoid papillary epithelioma of the left ureter, discovered in the subject post-mortem. No satisfactory history. The neoplasm occupied a peculiar diverticulum from the lower portion of the ureter, of the size of a hazelnut, and was beginning to manifest infiltrating properties.

Case II. Voelcker's case. Male, aged sixty-eight years. Hæmaturia four months. Pain across loins; nausea; villous carcinoma of lower two inches of left ureter. Metastasis of liver. Deeply infiltrated walls of ureter, with extension through upon its external surface.

CASE III. Wirsing and Blix. Female, aged forty-one years. Medullary carcinoma, first five inches of the ureter. Invasion of renal pelvis. Involvement of peritoneum and rectum. Hydronephrosis.

CASE IV. Hektoen. Female, aged fifty years. Increasing pain eight months. Right inguinal tumor, which seemed connected with right ilium. Bedridden three months. Diagnosis, clinically, osteosarcoma. Post-mortem, medullary carcinoma of right ureter, lower end of lumen of which admitted probe only about 2.5 cm. Inner surface of ilium eroded. Right kidney reduced to a cystic cavity containing 800 c.c. of slightly turbid, grayish, thick fluid.

CASE V. Rundle. Male, aged forty-six years. Tumor, right side, one year before. Hæmaturia. Lumbar nephrectomy. Numerous cylindrical cells in fluid. Squamous epithelioma of lower part of ureter projecting into bladder. Growth within two inches of renal pelvis. Metastasis in liver and lungs and mesenteric glands. Hydronephrosis.

CASE VI. Davy. Male, aged fifty-three years. Pain, left loin, down side, and in penis for three years, and increasing for past seven monthes. Hæmaturia, intermittent. Calculus, size of pea, passed six months before. Tumor in left groin for two years, now fluctuating, not painful, immovable. Hydronephrosis, thirty-three ounces of fluid, emptied but refilled. Nephrectomy. Probe in ureter passed down four inches. Death two months later. Calcium oxalate calculus, size of hazelnut, in the mass of an encephaloid carcinoma which involved the base of the bladder and the rectum, but apparently had arisen from the ureter at the seat of the calculus. The rectum had ulcerated through.

CASE VII. The case herein reported.

It will thus be observed that in only one case beside our own, that of Davy, was the stone found *in situ* as the probable cause of the growth; although the history of hæmaturia, especially where that appears early in the case, would strengthen the importance of calculus as a factor. The possible relation of errors of development is illustrated in Case 1. Primary carcinoma is in the ureter evidently a disease of rather advanced life. In the cases cited the age ranges between forty-one and sixty-eight years. All but two of the cases reported were in males.

The cardinal symptoms as they appear early are, in the order of their importance, pain, hæmaturia, and tumor. At least the first two may appear independently. The tumor would usually be that of renal enlargement due to obstruction, although as appeared in Hektoen's case there may be early enlargement of the neoplasm itself.

In the diagnosis of primary carcinoma of the ureter little of a pathognomonic character is to be derived from an examination of the urine By segregation of the urine it would be possible to find blood or cells from which a growth could be determined as present in either the renal pelvis or the ureter on the side on which they were found, and by sounding the ureter the presence of an obstructing growth could be more or less definitely made out. Morris calls attention to the evenness of distribution of the pus coming from the ureter or renal pelvis and the consequent slowness with which it settles to the bottom of the retainer. The location of the growth is by preference like that of the lodgement of calculi in the ureter, at one of the extremities or at the point of passage of the ureter over the brim of the pelvis. The following from Henry Morris summarizes the situation concisely: "Even when the side is indicated and a tumor is diagnosed it is still impossible to say whether the disease is primarily of and limited to the ureter, or primarily of and limited to the renal pelvis, or whether both these sections of the excretory duct are involved." And "if with the cystoscope vascular fringes or a pedunculated tumor or an ulcerated thickening at the orifice of the ureter is detected, the symptom is pathognomonic and the diagnosis is conclusive of disease of the ureter; but it affords no evidence as to whether the disease is primary or secondary, innocent or malignant; even if typically innocent below, cancer may be situated higher up."

It goes without saying that the treatment of primary carcinoma of the ureter is operative, and, since the location of the growth in this organ should give pronounced symptoms relatively early, a considerable proportion of cases should allow a fairly favorable prognosis. As a matter of fact, in the cases recorded up to this time no treatment was directed to the condition itself owing to a failure to make an ante-mortem diagnosis. When it is recognized that the ureter may become the seat of primary changes of a dangerous and even malignant character, doubtless such diagnosis will more often open the way to successful treatment. In urging the possibility of malignant changes it should not be forgotten that there should be no trifling with those seemingly benign. The proportion of recurrences after the removal of apparently simple papillary growths from the urinary tract is large, and in the recurring neoplasm the appearance of malignant characters is not uncommon. In a case reported by Roux, where a simple papilloma was removed from the renal pelvis, recurrence was in the form of a medullary carcinoma appearing ten years later. Again, the case we herein present illustrates the danger attending the neglect of calculi in the kidney and ureter. This point is all the more urgent when we consider the relative safety of nephrolithotomy and of ureterolithotomy in competent hands. The ureter should always be sounded in any exploration of the renal pelvis for calculus.

For the removal of any growth from the ureter, except in those rare cases where the tumor located at the vesical orifice is accessible through an incision and approach by way of the bladder, the lumbo-ilio-inguinal or ilio-inguinal incision will be chosen. The lumbar opening permits the better judgment of what disposition to make of the kidney. The sacral or vaginal approach in the female or the prerectal in the male would be a useful alternative in some cases where it was necessary to reach the vesical end of the ureter.

With a certain diagnosis of malignant disease of the ureter immediate nephro-ureterectomy is the only safe course. Even in cases of benign tumors, where a complete removal of the diseased tissue would not permit the satisfactory approximation of the parts or the implantation of the ureter into the bladder, the same course is imperative. The suggestion of the implantation of the ureter into the intestine does not seem practicable in the light of our present experimental knowledge on this subject.

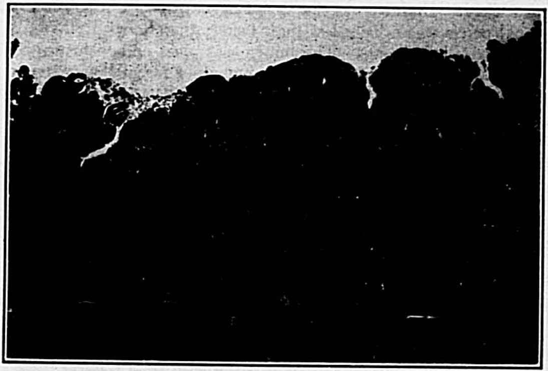
Where the region of the vesical attachment of the ureter cannot be absolutely freed from diseased tissue, Albarran, Morris, and others agree in advising an effort at its complete removal by way of the suprapubic incision, if necessary, at a subsequent operation.—W. F. M.

II. PATHOLOGICAL. 1. *Kidney*, with a small portion of ureter attached, removed at the first operation upon Mr. J. H., November 2, 1903. The kidney measured when removed 19 cm. by 13 cm. by 8 cm. Calices distended at the expense of the kidney substance by a thin, grayish purulent fluid until, with the exception of one wedge of relatively healthy tissue, the wall had a thickness of 0.5 mm. to 3 mm., and seemed on the point of bursting through at the thinner portions. Some tubular tissue remained in most of these thinner places, although under the mucosa was a deposit of old and recent inflammatory products. There were through the tissue cloudy swelling, hemorrhages, and many hyaline deposits. The wall of the lower renal pelvis was thickened, and in patches both here and in the calices the mucosa was velvety, with fine villous projections 0.2 mm. to 0.5 mm. in length. Areas covered with these fine villi were interspersed with others having ordinary transitional epithelium. Most of the villi here were simple or slightly branched, only occasionally one having an arborescent character and none so elaborately branched as the villi to be described in the lower ureter.

Covering these villi was an epithelium the outer layer of which was made up of rather long, pale-staining cylindrical cells with fairly deep-staining nuclei. In most of these villi there were underlying shorter cells, but in places the epithelium was thinned to a single layer of these long cells. Toward the base of the villus the single-celled arrangement was common where it seemed to be continuous with that of the cuboidal cells of the renal tubules. The villi of the renal pelvis usually presented a slender connective-tissue support or core.

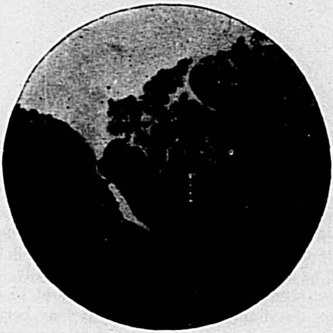
The picture here presented is one not uncommon in villous pyelitis; but attention is directed to the tendency toward a metaplasia from the ordinary transitional epithelium lining the pelvis toward a single-celled columnar type. The kidney as a whole was

FIG. 1.



Mucosa of renal pelvis. Transitional epithelium undergoing change to columnar. Magnified 30 diameters. (Dr. W. H. Knap.)

FIG. 2.

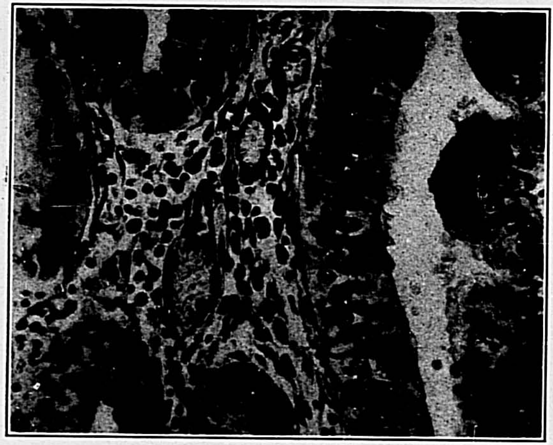


Mucosa of renal pelvis. Papillæ with columnar epithelium. Transitional epithelium with metaplasia to a columnar type. Magnified 65 diameters. (Dr. P. M. Hickey.)

found in a condition of pyonephrosis; the portion of relatively normal tissue remaining confirms the intermittent character of the nephrectasis.

2. *Ureter.* (*a*) The portion left attached to the kidney just described. Diameter at the point of narrowing just below the renal pelvis was a little less than 1 cm.; the abnormal thickening involved all the coats. The lumen was open and distended with pus. In the thickened mucosa are numerous radial clefts extending one-half to two-thirds of the way through the transitional epithelium, marking it off into roughly cuboidal portions, underneath which there is an increased proliferative activity of the connective tissue, as well as a decided increase of blood supply.

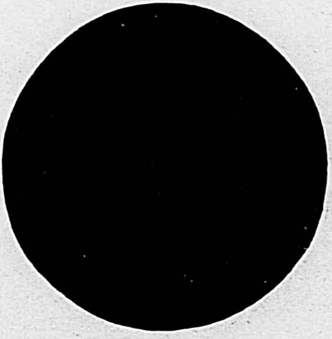
FIG. 3.



Mucosa of renal pelvis. Altered epithelium covering papillæ. Magnified 350 diameters. (Dr. W. H. Knap.)

(*b*) The next section is taken at a point about 15 cm. above the bladder, where the diameter was 1 cm. It may here be observed that from this point downward the ureter increases progressively in diameter until at the lowest point at which it is intact it measures 2.5 cm. by 3 cm. The remaining portion, about 1 cm. in length, includes a frayed-out end, where a new-growth surrounding a calculus had been separated in the effort to remove it. The lumen, circular in the upper portions, becomes crescentic at the point 2 cm. or 3 cm. above the lower extremity by reason of the upward extension of this new-growth. The naked-eye appearance, as well as that under the microscope, is more and more remarkable as we pass downward. The clefts become deeper, the submucous proliferation is more active, and the result is that the lumen is surrounded by a row of cuboidal gross divisions covered over with tongue-shaped projections from the modified transitional epithelium. One striking change, the beginnings of which are to be seen in the section described above (*a*), is the alteration in form in the superficial layer of cells of the transitional epithelium toward a distinctly columnar type, with long pale-staining cylindrical cell-body and rather deep-staining nucleus removed to the end of the cell toward the basement membrane. It seems to be the same change, in less marked degree, as is present in the papillary areas described in the kidney pelvis. Along with the change to a columnar form of the cells, the multiplication of the clefts, themselves lined with these same columnar cells, and the submucous proliferation, there comes a thinning out of the deeper layers of the stratified epithelium. The end-product of this change seems to be the condition found in the next section, (*c*), where the main divisions become the trunk and the subsidiary papillary processes the branches of the elaborate arborescent villi there seen. In the deepest layer of the transitional epithelium, the cells often show an unusually pronounced columnar character illustrating the apparently general tendency.

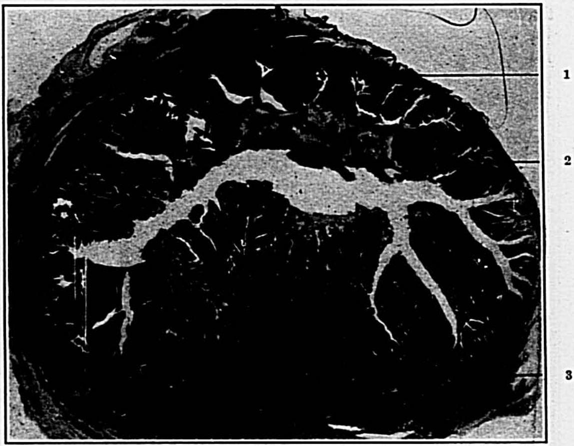
FIG. 4.



Mucosa of upper ureter. Formation of clefts. Beginning of change of transitional epithelium to columnar type. Magnified 200 diameters. (Dr. P. M. Hickey.)

(*c*) This section was taken 3.5 cm. above the bladder. While in the previous sections the proliferation of the submucosa and the epithelium has thrown the wall of the lumen into an unusual number of broad folds, and the epithelial increase has aided the formation of the finer villous processes, we here find the mucosa, now thinned to a single layer of tall cylindrical cells, covering the arborescent villi just mentioned. These extend from 1 mm. to 2.5 mm. out from the wall into the lumen, and each has a well-developed connective tissue support or core. Twelve or thirteen of these large villi surround the lumen, and the circle is completed by the presence at one side of two broader, less prominent papillomatous folds like those in the last-described section. These folds, in the same way, are covered with transitional epithelium traversed by the same radial clefts, and otherwise similarly altered. The apparent transition between these two kinds of epithelium, as well as the fact that so small a portion of the circumference is left covered by the form found in the sections above, seems to indicate an active progress of the change here found.

FIG. 5.



Cross-section of ureter, 2.5 cm. from bladder, 1 cm. below section (*c*) described in the text, and somewhat above the section described at (*d*). 1. Papillary processes covered with transitional epithelium. 2. Arborescent villi extending over the area of adenocarcinoma at 3. Magnified 8 diameters. (Dr. W. H. Knap.)

The picture of this arborescent villous growth is, in section, that of a simple adenoma which stands in apparently a transitional relation between the papillomatous hyperplasia of the sections above and the malignant tissue product observed in the next section. It is interesting to note that upon the side of the arborescent villous next to the broader folds above described the transitional epithelial covering of the latter rises to a little distance from the base, as though the process of transformation were incomplete.

(*d*) This section, taken across the ureter just above the point of lodgement of the calculus, shows the arborescent villi arranged, as in (*c*), about the lumen, here crescentic, while upon the opposite thickened wall none of these appear. At the edge of this thickened portion, which is the section of the upper end of the cancerous mass, there may be found, in continuity with the cylindrical-celled epithelium covering the arborescent villi, more or less definite gland-like extensions of the epithelium downward toward the muscular structures. By the abnormal proliferation of the cells of these gland-like processes, however, the epithelial arrangement is soon lost, and there is left only the more or less rounded areas of cancer cells divided by the intervening stroma. The grades in this transition are easily traced at the advancing line of the neoplasm. The cells are altered in form by the compression induced by their rapid growth, and the nuclei are less deeply stained, but the steps in this process are evident.

FIG. 6.

Adenocarcinoma of the ureter, juxtavesical portion, in proximity to calculus. Showing change of gland-like processes at base of arborescent villi to carcinoma. Magnified 65 diameters. (Dr. P. M. Hickey.)

We may then speak of the condition in the lower ureter in immediate proximity to the seat of the calculus as adenocarcinoma, primary in this location and medullary in character. There seems little question of the etiological relation of the calculus by reason of its long-continued irritation. Almost as conclusive is the evidence that the papillary changes, more and more pronounced as the seat of the calculus is approached, as well as the adenoma, apparently representing an intermediary wave of influence, are only the more remote effects of the same irritating cause.

The condition observed in the mucosa of the renal pelvis, tending toward the same adenomatous change, finds its place then as another step in the process, probably likewise induced by the irritating presence of the calculus before its escape into the ureter and checked in its course by the latter event. The alternative of accounting for the adenomatous condition in the ureter by the development of isolated remnants of the Wolffian body or hypothetical glandular structures is given less weight both by reason of this change in the kidney and the metaplasia toward a simple columnar epithelium from the normal transitional type observed in both organs. One other possibility suggests itself, viz., that the adenoma seen in the ureter has resulted from the engrafting upon the ureteral mucosa of correspondingly changed cells cast off from the lining of the renal pelvis; but this in no way alters the aspect of the case so far as the metaplasia is concerned, and it is as easy to believe that the whole process could follow the same influences at the lower focus.

3. *Tissue* removed from *behind the bladder* at operation, December 26, 1903, showed the same irregular, encephaloid mass of cells in groups separated by bands of stroma as were seen in the primary tumor.

4. *Calculus* of calcium oxalate weighing 1.25 grams and measuring 17 mm. by 9.5 mm. by 8 mm. Its surface is roughened by fine but rather sharp projections. In general its form suggests that of an olive stone. It is very hard, and in section there are to be seen concentric layers of a grayish-brown color.

It should be observed that calcium oxalate calculi are the ones most apt to be associated with tumors of the ureter and the renal pelvis.—H. E. S.

Acknowledgments are due Dr. Preston M. Hickey, of Detroit, and Dr. W. H. Knap, of Chicago, for the character of their photomicrographic work. We are also under obligation to Dr. A. S. Warthin, of Ann Arbor, and Dr. Gustav Fuetterer, of Chicago, for their kindly criticism and suggestions.

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PRIMARY SARCOMA OF THE BLADDER.

WITH A REPORT OF THREE CASES AND REVIEW OF THE LITERATURE.

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After a careful review of the literature on the subject the author has been impressed by the fact that sarcoma of the urinary bladder, as compared with other tumors of this viscus, is of decidedly uncommon occurrence. As an illustration of its infrequency the following expressions from some of the recent editions of our American text-books on pathology are quoted: "Sarcoma of the bladder is very rare;" "Sarcoma (of the bladder) has been described," etc. In some of the works consulted no reference is made to the subject.

Senftleben[33] receives the credit for having recorded the first case of this disease in 1861, the specimen having been examined by Billroth and pronounced sarcoma by him. Since then a considerable number of cases have been reported, but as in some of the reports the result of a microscopic examination is not given, and as some of the specimens were old museum specimens, the diagnosis may in part of the cases be questioned. It will be noted that the majority of the cases have been reported by English and German observers. In this country cases have been published by Stimson,[26] Musser,[18] Weir,[45] Krouse,[28] and Bunce.[29] W. R. Williams,[4 5] (1882–83) receives the credit for having recorded the greatest number of cases, 6 in all, 3 of which were specimens in the museum of the Middlesex Hospital. In reporting a case in 1888, D'Arcy A. Power[19] mentions 9 cases in all of sarcoma of the bladder preserved in the museums of the London hospitals. At as recent a date as 1884 Sir Henry Thompson stated: "The existence of true sarcoma of the bladder has been confirmed, but not on the observation of fresh specimens." In 1890 the same author,[8] in recording a series of 41 cases of vesical tumors operated by himself, speaks of three of them as being sarcoma.